

ADDITIONAL NOTES ON THE ERIOCAULACEAE. XXIII

Harold N. Moldenke

ERIOCAULON ? POROSUM Lesq.

Additional bibliography: Moldenke, *Phytologia* 18: 396. 1969.

Continuing the quotation from Lesquereux (1878) begun at the conclusion of the previous installment of these Notes: "The leaves of the fossil species, four to five centimeters long, seven millimeters across in the middle, are broader and longer and have also the surface narrowly wrinkled across or in an oblique direction to the middle (fig. 2a), these wrinkles tending downward and passing down along the border, sometimes like anastomoses of the veins. The base of these leaves is either covered by superposition of others or destroyed; it is therefore impossible to further extend the comparison. Abolboda poarchon, Sieb., of Brazil, a species of the same group of the Xirideae, also offers a likeness by its leaves to those of this fossil plant. Habitat. — Sand Creek (Mr. W. H. Holmes), with leaves of Nelumbium and other species found also at Golden, and therefore of Lower Eocene type."

Knowlton (1930) reviews the status of this plant as follows: "Lesquereux's original description reads as follows: Leaves basilar, rosulate, spreading, entire, linear-lanceolate, broader at the middle, gradually tapering upward to a slightly oblique point and downward to a very short petiole; median nerve broad, concave; lateral veins two, nearly parallel, with apparent ramifications toward the borders, forming round polygonal small areolae. The leaves are thick, of a spongy texture apparently; the meshes along the borders are not distinct and may be formed by contraction of the epidermis. I do not find any species to which this form may be compared, except the leaves of some large rosulate Eriocaulon. The specimen is cut through by rootlets as thick as the leaves are broad.

"Thus far the type specimen, which is before me as I write (U. S. Nat. Mus. No. 137), is the only one that has been found. The type specimen is preserved on a piece of soft, fine-grained clay and has been fairly well described and figured by Lesquereux. It is preserved on and partly wrapped around the end of the piece of matrix, and the 'leaves', therefore, so not all lie in the same plane. Apparently, however, as Lesquereux supposed, they were disposed in a circle, possibly around a stem. The nervation in these 'leaves' is uncertain. There is clearly a strong central nerve or midrib and apparently about two thinner ribs on each side, but the remainder is obscure and uncertain. The 'leaf' was evidently a very thick and leathery one, and the surface has been more or less wrinkled, in addition to which there are numerous obvious joint checks, so that any actual nervation, if present, is difficult to make out. It seems probable, however, that some of

the meshing or areolation must belong to the nervation.

"In subsequent years a number of organisms were found, mainly in older rocks, that were at first thought to be at least congeneric with the E. ? porosum of Lesquereux. They were mostly isolated 'leaves' or segments, though occasionally several were found that showed these segments pretty closely associated. It was not, however, until some very perfect examples were found in the Vermejo formation in the Canon City field of Colorado that the distinctness from Lesquereux's species became clear. These were described under the name Palaeoaster inquirenda Knowlton [U. S. Geol. Surv. Prof. Paper 101: 278, pl. 69, fig. 5 & 6. 1918] with the frank admission that their affinity was unrecognized. They consist of 8 to 12, usually about 9 narrow, erect 'leaves' or members 3.5 to about 4.5 centimeters long and 6 to 10 millimeters wide in the middle. They are slightly narrowed to the sessile base, where they are in contact, though evidently perfectly free from each other. Above they are narrowed to a very slender acuminate point, usually somewhat incurved. The segments are thick and leathery, if not indeed woody, and are traversed dorsally by a deep median furrow. These specimens, preserved in rather coarse sandstone, show very little trace of structure other than the median rib.

"It seems probable that these organisms were terminal, for there is some evidence of the presence of a scar or point of attachment at the base, but no axis on which they might have stood has ever been noted. They are certainly not leaves whorled around a stem, for, had they been, some trace of the stem should have been detected in some of the numerous specimens. It appears much more likely that they were capsular in nature, for, if the now spreading segments were brought together, they would apparently make a tightly closed 'capsule'. The incurved tips of the segments lend support to this view, though no evidence of seeds or other interior structure has been observed.

"Among the several lots of specimens from the Raton Mesa region there is one found near Walsenburg that consists of a number of detached leaves or segments. Only three or four leaves are preserved on any piece of matrix, but these seem to arise from a central point, as in the other examples referred to Palaeoaster inquirenda and as in the type of Eriocaulon ? porosum. The leaves in these Walsenburg specimens are rather longer and narrower than common, and they appear, if anything to have been thicker, as shown by the layer of carbonaceous matter remaining in favored places. The midrib is very deeply impressed-channelled, in fact -- and at right angles to it there are minute parallel lines connecting with the margin. These specimens approach most closely Eriocaulon ? porosum, and it is possible that they should be united. However, the specimens involved are so few in number and their nature so obscure that it seems best to hold them apart until more conclusive data are forthcoming. It is, of course, practically certain that Lesquereux's species has no connection whatever with the genus Eriocaulon, but, on the other hand, it is

not at all clear that there is any closer affinity.

"The specimen from Black Buttes, Wyo., that was referred by Lesquereux [The Tertiary Flora 296, pl. 59, fig. 10. 1878] to Eucalyptus haeringiana ? Ettingshausen is probably also congeneric with Eriocaulon ? porosum and possibly also with the leaves above mentioned from Walsenburg. In any event it is fairly clear that this specimen has nothing to do with Eucalyptus.

"Occurrence: Denver formation, Sand Creek about 12 miles east of Denver, Colorado, supposed to have been collected by W. H. Holmes."

ERIOCAULON PRINGLEI S. Wats.

Bibliography: S. Wats., Proc. Am. Acad. 23: 283. 1888; Morong, Bull. Torr. Bot. Club 18: 358. 1891; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 43, 56, & 287. 1903; H. B. Davis, Life & Works Pringle 43 & 55. 1936; Moldenke, N. Am. Fl. 19 (1): 20 & 37. 1937; Moldenke, Phytologia 1: 322. 1939; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158. 1941; Moldenke, Known Geogr. Distrib. Erioc. 4 & 38. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 30 & 206. 1949; Moldenke, Phytologia 3: 341. 1950; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158. 1959; Moldenke, Résumé 36 & 482. 1959.

Additional citations: MEXICO: Chihuahua: Pringle 2018 (B, Ca-115170, Ms--15479, Mu--369).

ERIOCAULON PSEUDOCOMPRESSUM Ruhl.

Bibliography: Ruhl. in Urb., Symb. Ant. 1: 492. 1900; Ruhl. in Engl., Pflanzenreich 13 (4-30): 32, 34, 285, & 287. 1903; Thiselet-Dyer, Ind. Kew. Suppl. 2: 70. 1904; Moldenke, N. Am. Fl. 19 (1): 18 & 24--25. 1937; Moldenke, Phytologia 1: 322. 1939; León, Fl. Cuba 1: 279, fig. 112. 1946; Moldenke, Known Geogr. Distrib. Erioc. 4, 35, & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 43 & 206. 1949; Moldenke, Phytologia 3: 341. 1950; Moldenke, Résumé 51, 288, & 482. 1959; Moldenke, Phytologia 17: 498 & 500 (1968) and 18: 367. 1969.

Illustrations: León, Fl. Cuba 1: 279, fig. 112. 1946.

Recent collectors have found this plant in flower in December.

Additional citations: CUBA: Pinar del Río: Ekman 11221 (S), 11471 (S), 17237 (S); Killip 32372 (N); León 17005 (V1); Marie-Victorin 58318 (Vi, V1); Marie-Victorin & Alain 327 (Mv), 377 (Mv); C. Wright 3741 (S--isotype).

ERIOCAULON PSEUDOQUINQUANGULARE Ruhl.

Synonymy: Eriocaulon pseudo-quinquangulare Ruhl. apud Fyson, Journ. Indian Bot. 3: 16. 1922.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 73, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Fyson, Journ. Indian Bot. 3: 16. 1922; Duthie, Fl. Upper Ganget. Plain 3: 318 & 320. 1929; Moldenke, Known Geogr. Distrib. Erioc. 23 & 39. 1946;

Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 127 & 206. 1949; Razi, Rec. Bot. Surv. India 18: 19. 1959; Moldenke, Résumé 162 & 482. 1959.

Citations: INDIA: Uttar Pradesh: Lehmann s.n. [Saharsampore, Jard. bot.] (B--type, Z--isotype).

ERIOCAULON PTEROSEPALUM Herzog

Bibliography: Herzog in Fedde, Repert. Spec. Nov. 29: 204, pl. 120. 1931; A. W. Hill, Ind. Kew. Suppl. 9: 105. 1938; Moldenke, Known Geogr. Distrib. Erioc. 8 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 206. 1949; Moldenke, Phytologia 3: 341. 1950; Moldenke, Résumé 89 & 482. 1959.

Illustrations: Herzog in Fedde, Repert. Spec. Nov. 29: pl. 120. 1931.

The species has been collected on wet campos, "almost in water", flowering and fruiting in September. The E. pterosepalum Hayata is a synonym of E. sexangulare L. The Simada 432, distributed as E. pterosepalum, is actually E. sexangulare L.

Additional citations: BRAZIL: Amazonas: Luetzelburg 21052 [Herb. Mus. Nac. Rio Jan. 47705; Macbride photos 18690] (Mu--type, N--photo of type, W--photo of type), 21053 (Mu, Z).

ERIOCAULON PUBIGERUM Bong.

Bibliography: Bong., Mém. Acad. Pétersb., sér. 6, 1: 628, pl. 42. 1831; Kunth, Enum. Pl. 3: 575. 1841; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879 (1893) and pr. 2, 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 8 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Résumé 89 & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960.

Kunth (1841) writes the initial letter of the specific epithet of this species with a capital and describes the plant as follows: "Acaule; foliis lineari-lanceolatis, acutis, pubescentibus; pedunculis gracilibus, pubescentibus; vaginis apice pilosobarbatis. Bong. -- Brasilia". He also cites the original publication as "Act. Petrop. 6. 1. 628, t. 42", but comments that the illustration was never actually published. The name has been overlooked by Körnicke, by Martius, and by Ruhland. Nothing is known to me about the plant except what is stated in the above bibliography.

ERIOCAULON PULCHELLUM Körn.

Synonymy: Eriocaulon pumilum Afzel. ex Körn., Linnaea 27: 621. 1856 [not E. pumilum Cham., 1959, nor Raf., 1832]. Eriocaulon pumilum N. E. Br. apud Ruhl. in Engl., Pflanzenreich 13 (4-30): 97 & 287, in syn. 1903. Eriocaulon sierraleonense Moldenke, Known Geogr. Distrib. Erioc. 21 & 40, hyponym, February 9. 1946; Phytologia 2: 134, July 8. 1946. Eriocaulon pumilum "Afzel. ex Körn." apud Meikle & Baldwin, Am. Journ. Bot. 39: 45. 1952.

Bibliography: Körn., Linnaea 27: 621--622. 1856; C. Müll. in

Walp., Ann. 5: 926 & 935 (1860) and 6: 1171. 1861; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 24. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Thiselt.-Dyer, Fl. Trop. Afr. 8: 237. 1901; Ruhl. in Engl., Pflanzenreich 13 (4-30): 65, 97, 99, & 287, fig. 13. 1903; Hutchinson & Dalz., Fl. W. Trop. Afr. 2: 326. 1936; Moldenke, Known Geogr. Distrib. Erioc. 20, 21, 36, 39, & 40. 1946; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Phytologia 2: 134. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111 & 206. 1949; Moldenke, Phytologia 3: 398. 1950; Meikle & Baldwin, Am. Journ. Bot. 39: 45. 1952; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 136, 137, 289, 291, 292, & 482. 1959; Moldenke, Résumé Suppl. 1: 18. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Résumé Suppl. 4: 6 (1962) and 17: 4. 1968; Moldenke, Phytologia 18: 367. 1969.

Illustrations: Ruhl. in Engl., Pflanzenreich 13 (4-30): 99, fig. 13. 1903.

Meikle & Baldwin (1952) say "The opinion of N. E. Brown that E. pumilum Afzel. ex Koern. and E. pulchellum Koern. are conspecific is accepted. Moldenke distinguished between the two and applied the name E. sierraleonense to the plant formerly (and incorrectly) designated E. pumilum." In a letter to me, dated October 26, 1951, Meikle says also that he follows N. E. Brown in uniting the "E. pumilum Afzel." with E. pulchellum Körn. because on the basis of Kew material the bract characters given by Ruhland are not valid. It should be noted here that the E. pumilum Chapm., referred to in the synonymy above, is actually a synonym of Lachnocaulon engleri Ruhl., while the homonym of Rafinesque is a synonym of E. pellucidum Michx.

It should also be noted that the E. kindiae H. Lecomte formerly regarded by me as a synonym of E. pulchellum is now better regarded as E. plumale subsp. kindiae (H. Lecomte) Meikle. The Afzelium 11 in the Stockholm herbarium, cited below, may actually be part of the type collection of E. pulchellum Körn. or of E. pumilum Afzel., or both, although the Berlin herbarium specimens actually examined by Körnicke are unnumbered.

The species has been collected at altitudes of 2000 to 2500 feet on savannas, flowering and fruiting in August and October. Baldwin describes it as "common on open rock in seepage" in the Republic of Guinea.

Citations: SÉNÉGAL: J. G. Adam s.n. [Oct. 1961] (Z). REPUBLIC OF GUINEA: J. T. Baldwin 9800 (N); Boismare 376 [Herb. Chillou 3894] (An); Schnell 2365 (An). SIERRA LEONE: Afzelius 11 (S), s.n. (B—type, B—isotype); Jaeger 397 (An). LIBERIA: J. T. Baldwin 9176 (N). MOUNTED ILLUSTRATIONS: Ruhland fig. 14 E—N (B).

ERIOCAULON PULLUM Koyama

Bibliography: Koyama, Journ. Jap. Bot. 31: 11—12, fig. 4. 1956; Moldenke, Résumé 170 & 482. 1959; G. Taylor, Ind. Kew. Suppl.

13: 52. 1966.

Illustrations: Koyama, Journ. Jap. Bot. 31: 11, fig. 4. 1956.

The type of this species was collected by Bunzō Hayata at Yün-nanfou, Yüman, China, and is deposited in the herbarium of the University of Tokyo.

ERIOCAULON PULVINATUM Van Royen

Bibliography: Van Royen, Blumea 11: [224]—225, fig. 1. 1961; Moldenke, Phytologia 18: 364. 1969.

Illustrations: Van Royen, Blumea 11: 225, fig. 1. 1961.

ERIOCAULON PUMILIO Hook. f.

Bibliography: Hook. f., Fl. Brit. Ind. 6: 581—582. 1893; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 1, 158. 1902; Ruhl. in Engl., Pflanzenreich 13 (4-30): 116 & 287. 1903; H. Lecomte, Journ. de Bot. 21: 108. 1908; Fyson, Journ. Indian Bot. 2: 198—199, pl. 7. 1921; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 2, 158. 1941; Moldenke, Known Geogr. Distrib. Erioc. 23 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 127 & 206. 1949; Durand & Jacks., Ind. Kew. Suppl. 1, pr. 3, 158. 1959; Moldenke, Résumé 162 & 482. 1959.

Illustrations: Fyson, Journ. Indian Bot. 2: pl. 7. 1921.

Fyson (1921) cites Duthie 4473 in the Dehra Dun herbarium and says "Very small. Stem 0, tufted. Leaves 1/4 — 1/2 in. acicular. Scapes 1 in. Heads 1/8. Involucral bracts obtuse, pale nearly or quite horizontal. Floral bracts cuneate-cuspidate, dark but hairy. Receptacle glabrous. Female fl: sepals 2, deeply boat shaped; petals 3. Male fl: normal.....Western Himalayas at 3—4000 ft.; Kumaon and Gharwal at 8—9,000 ft. (F. B. I): Nr. Ramri. I have seen only the one specimen quoted above. The sepals are large, Ruhland says of the species that they are flat and concave only at the tips, but those of the specimen seen by me are quite boat shaped for the whole length."

The initial letter of the specific epithet is often upper-cased.

ERIOCAULON PUSILLUM R. Br.

Bibliography: R. Br., Prod. Fl. Nov. Holl. 1: 254. 1810; Roem. & Schult. in L., Syst. Veg., ed. 15 nova, 2: 869. 1817; Spreng. in L., Syst. Veg., ed. 16, 3: 775. 1826; Kunth, Enum. Pl. 3: 571. 1841; C. Müll. in Walp., Ann. 5: 926 & 935 (1860) and 6: 1171. 1861; Benth., Fl. Austral. 7: 191, 194, & 792. 1878; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 24. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 103, 107, & 287. 1903; F. M. Bailey, Compreh. Cat. Queensl. Fl. 584. 1913; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 28 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153 & 206. 1949; Moldenke, Résumé 209 & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; Moldenke, Phytologia 18: 303 & 304. 1969.

Kunth (1841) uppercases the initial letter of the specific

epithet and describes the species as follows: "Scapis setaceis, striatis (4—6 lin.), vagina laxa vix duplo longioribus; squamis involucrentibus oblongis, scariosis, albis, capitulum turbinatum pauciflorum superantibus; antheris nigris. Brown. — Nova Hollandia tropica." It should be noted that E. pusillum Bong. (1831) is a synonym of Syngonanthus minutulus (Steud.) Moldenke, E. pusillum Poepp. (1863) is a synonym of Paepalanthus perpusillus Kunth, and E. pusillum Willd. (1841) is a synonym of E. microcephalum H.B.K.

ERIOCAULON PYGMAEUM Soland.

Synonymy: Eriocaulon nigricans R. Br., Prod. Fl. Nov. Holl. 1: 254. 1810.

Bibliography: Soland. ex J. E. Sm. in Rees, Cycl. 13: Eriocaulon. 1809; R. Br., Prod. Fl. Nov. Holl. 1: 254. 1810; Roem. & Schult. in L., Syst. Veg., ed. 15 nova, 2: 869. 1817; Spreng. in L., Syst. Veg., ed. 16, 3: 775. 1826; Kunth, Enum. Pl. 3: 570. 1841; Dalz. in Hook., Kew Journ. 3: 281—282. 1851; C. Müll. in Walp., Ann. 5: 926, 927, 934, & 947 (1860) and 6: 1171. 1861; Benth., Fl. Austral. 7: 191, 194, & 792. 1878; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 25. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879. 1893; Britten, Journ. Bot. 38: 481—483. 1900; Ruhl. in Engl., Pflanzenreich 13 (4—30): 115, 286, & 287. 1903; F. M. Bailey, Compreh. Cat. Queensl. Pl. 584, fig. 566. 1913; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 879. 1946; Moldenke, Known Geogr. Distrib. Erioc. 28, 37, & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153 & 206. 1949; Moldenke, Résumé 209, 290, & 482. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 879. 1960; J. S. Beard, Descrip. Cat. W. Austral. Pl. 9. 1965; Moldenke, Résumé Suppl. 15: 14. 1967; Moldenke, Phytologia 17: 477 (1966) and 18: 167 & 250. 1969.

Illustrations: F. M. Bailey, Compreh. Cat. Queensl. Pl. fig. 566. 1913.

It should be mentioned here that Bentham (1878) and Jackson (1893) reduce E. achiton Körn. to synonymy under E. nigricans R. Br., but I regard it as a valid species from Pakistan and India. The E. pygmaeum Dalz. is a synonym of E. xeranthemum Mart., while E. pygmaeum Körn. is now called E. koernickei Britten and E. pygmaeum Mart. is in the synonymy of Paepalanthus bifidus (Schrad.) Kunth.

Citations: AUSTRALIAN REGION: AUSTRALIA: Queensland: E. Henry 4653 (Qu). State undetermined: Banks & Solander s.n. [New Holland, 1770] (B—*isotype*, Z—*isotype*). MOUNTED CLIPPINGS: original description (B).

ERIOCAULON QUINQUANGULARE L.

Synonymy: Randalia maderaspatana Petiv., Mus. 796. 1695. Scabiosa graminifolia nudicaulis, capitulis argenteis, s. Statice minima Maderaspatana Fluk., Almag. 3: 336, Phytogr. pl. 221, fig.

7. 1696. Gramen junceum Ind. Orient. minus, capiculo rotundo, ex paleaceis spiculis, in cacumine caulis glomerato; Graminis bufonij aemolv. Callapillee Malabarorum, cum proxime praecedenti plurimum convenit Pluk., Alm. Bot. Mant. 98. 1700. Gramen indicum capitulis tomentosis Herm., Mus. Zeyl. 17. 1717. Gramen junceum, chamaemeli capitulis, aphyllis, albis Herm. ex J. Burm., Thes. Zeyl. 108—109. 1737. Gramen junceum, Indiae Orientalis, minus, capitulo rotundo, ex paleaceis spiculis in cacumine caulis glomerato Pluk. apud J. Burm., Thes. Zeyl. 108, in syn. 1737. Kokmotha zeylonensibus J. Burm., Thes. Zeyl. 108, in syn. 1737. Gramen indicum, capitulis tomentosis Herm. apud J. Burm., Thes. Zeyl. 108, in syn. 1737. Eriocavlon scabiosa Crantz, Inst. Rei Herb. 1: 360. 1766. Eriocavlon quinquangulare L. apud Reich. in L., Syst. Pl. 1: 243. 1779. Eriocaulon quinquang. L. apud J. A. Murr. in L., Syst. Veg., ed. 13, 1: 109. 1783. Leucocephala graminifolia Roxb., Hort. Beng. 68, hyponym (1814); Fl. Ind. 3: 612. 1832. Sphaerochloa quinquangularis Beauv. & Desv., Ann. Sci. Nat. 13: 47. 1828. Eriocaulon argenteum Mart. in Wall., Plant. As. Rar. 3: 28. 1832 [not E. argenteum Bong., 1831]. Eriocaulon quinquangulare Wight ex Wall., Numer. List 207, in syn. 1832 [not E. quinquangulare Bojer, 1964, nor Heyne, 1832, nor Mart., 1854, nor Wall., 1858, nor Willd., 1959]. Eriocaulon setaceum Wight ex Wall., Numer. List 207, in syn. 1832 [not E. setaceum Auct., 1903, nor Benth., 1893, nor Crantz, 1766, nor Heyne, 1832, nor L., 1753, nor Lour., 1790, nor Rottl., 1960, nor Wall., 1893, nor Willd., 1959]. Gramen junceum Chamaemeli capitulis albi aphyllis J. Burm. apud Mart. in Wall., Plant. As. Rar. 3: 28, in syn. 1832. Scabiosa graminea nudicaulis, capitulis argenteis s. Statice minima maderaspatana Pluk. apud Mart. in Wall., Plant. As. Rar. 3: 28, in syn. 1832. Eriocaulon triangulare Bernhardtii ex Kunth, Enum. Pl. 3: 556, in syn. 1841 [not E. triangulare L., 1762]. Eriocaulon argenteum Wight ex Kunth, Enum. Pl. 3: 556, in syn. 1841. Eriocaulon argyraeum Steud., Syn. Fl. Glum. 2: [Cyp.] 271. 1855. Eriocaulon leucocephalum Steud., Syn. Fl. Glum. 2: [Cyp.] 272. 1855. Eriocaulon erythropodium Miq. ex Körn., Linnaea 27: 642. 1856. Eriocaulon quinquangulare var. α C. Müll. in Walp., Ann. 5: 940. 1860. Eriocaulon argyreum Steud. apud C. Müll. in Walp., Ann. 6: 1170, sphalm. 1861. Eriocaulon scabiosa Crantz apud Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 879, in syn. 1893. Sphaerochloa quadrangularis Beauv. ex Hook. f., Fl. Brit. Ind. 6: 582, in syn. 1893. Eriocaulon quinqueangulare L. ex Prain, Beng. Fl., pr. 1, 1127. 1903. Eriocaulon argenteum Heyne ex Moldenke, Résumé 285, in syn. 1959. Eriocaulon pentangulare L. ex Moldenke, Résumé

291, in syn. 1959. Eriocaulon 5-angulare L. ex Moldenke, *Résumé*
 294, in syn. 1959. Gramen junceum Chamaemeli capitulis, aphyllis
 J. Burm. apud Lourteig, *Taxon* 15: 31, in syn. 1966. Eriocaulon
setosum Wight ex Moldenke, *Résumé Suppl.* 18: 11, in syn. 1969.

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1125, 1128, & 1333. 1956; Moldenke, Résumé 158, 159, 162, 165, 167, 176, 285, 287, 289—291, 294, 309, 345, 415, & 482. 1959; Moldenke, Résumé Suppl. 1: 16 & 18. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 877—879 (1960) and 2: 71 & 960. 1960; Van Royen, Blumea 10: 135. 1960; Nath, Bot. Surv. South. Shan States 62. 1960; Moldenke, Résumé Suppl. 3: 15 & 17. 1962; Seerwani, Bull. Bot. Surv. India 4: 230. 1962; Prain, Beng. Pl., ed. 2, 2: 847 & 848. 1963; J. Joseph, Bull. Bot. Surv. India 5: 297. 1963; J. K. Maheshwari, Bull. Bot. Surv. India 5: 138. 1963; Punt, Reg. Veg. 36: 9. 1964; Bhattacharyya, Bull. Bot. Surv. India 6: 208. 1964; Panigrahi, Chowdhury, Raju, & Deka, Bull. Bot. Surv. India 6: 241, 260, & 261. 1964; Moldenke, Résumé Suppl. 11: 6 (1964) and 12: 7. 1965; J. S. Beard, Descrip. Cat. W. Austral. Pl. 9. 1965; Thanikaimoni, Pollen & Spores 7: 185. 1965; Subramanyam & Henry, Bull. Bot. Surv. India 8: 214. 1966; Sebastine & Ramamurthy, Bull. Bot. Surv. India 8: 182. 1966; Panigrahi, Bull. Bot. Surv. India 8: 13. 1966; Malick, Bull. Bot. Surv. India 8: 58. 1966; Begum, Curr. Sci. India 35: 262—263. 1966; S. V. Ramaswami, Stud. Flow. Pl. Bangalore [thesis] 220, 222—223, 1106, & 1107. 1966; J. L. Ellis, Bull. Bot. Surv. India 8: 329 & 339. 1966; Sebastine & Henry, Bull. Bot. Surv. India 8: 310. 1966; Lourteig, Taxon 15: 31. 1966; Moldenke, Résumé Suppl. 14: 9 (1966) and 15: 8 & 11. 1967; Begum, Bioresearch Index Tit. 1967: 2255. 1967; Anon., Ind. Bibliog. Bot. Trop. 4 (1): 18. 1967; Moldenke, Résumé Suppl. 16: 9 (1968) and 17: 11. 1968; Begum, Proc. Indian Acad. Sci. B. 67: 148—156. 1968; Moldenke, Phytologia 17: 463 (1968), 18: 52 & 53 (1968), and 18: 101, 102, 169, 173, 174, 243, 244, 258, 263, 264, 273, 328, 348, 360, 379, & 396. 1969; Anon., Biol. Abstr. 50 (1): S.61. 1969; Begum, Biol. Abstr. 50: 422. 1969.

Illustrations: Fluk., Almag. 3: Phytogr. pl. 221, fig. 7. 1696; Fyson, Journ. Indian Bot. 2: pl. 9. 1921; Begum, Proc. Indian Acad. Sci. B. 67: 148—156. 1968.

Prain (1963) describes this species as follows: "Involucral bracts alone glabrous, floral bearded or pubescent; receptacle villous.....Perennial; rootstock elongated, slender or stout; leaves ensiform or broadly subulate.....Female flowers distinctly pedicelled.....Involucral bracts at length reflexed under the globose grey or snow-white heads; leaves reddish, often semitranslucent." He says that the plant is an "herb of rice-fields and wet places.....In all the provinces" of Bengal. Recent collectors have found it growing in mud, at altitudes of 80 to 1330 meters, flowering and fruiting from September to March. Common names recorded for it are "bhuri", "bhurli", and "guri", while German authors call it "5winklichte Kugelbinse".

Ramaswamy says of his no. 3 "The average height of the plant was in between 6—14 inches. The plants were generally pinkish with light grey heads. They were luxuriantly growing in the black cotton soil [of Mysore]. The associated plants were the marsh plants of Commelinaceae and Poaceae." Malick (1966) calls it common in West Bengal and cites Biswas 11. Ellis (1966) found

it in marshy places near the fringes of puddles formed during the rainy season in January and February in Andhra Pradesh, and cites the Herb. Indian Bot. Surv. 15743; Sebastine & Henry (1966) refer to it as "common" in the same state and cite 11675. Bhattacharyya (1964) avers that the species is "common in moist rice fields" in Uttar Pradesh, while Seerwani (1962) records it from Jabalpur. Panigrahi and his associates (1964) call it a hygrophyte and state that it is "abundant in fields" in Orissa. Panigrahi (1966) found it to be abundant in rice fields, in semi-dry mud, or on rock shoulders with a soil cover in Bihar, citing 11876 & 12005. Givindu (1949) says that it blooms from December to February in Bangalore. Joseph (1963) reports it "common in wet localities" in Madhya Pradesh, while Maheshwari (1963) found it to be "common in washes and in wet or dry fallow land" in the same state, from which Subramanyam & Henry (1966) cite 7098 & 7212. It is said to be "common" in Madras by Sebastine & Ramamurthy (1966), who cite 15082 in the Survey herbarium. Waring reports that in Orissa it is rubbed on the body to cure ringworm.

Fyson (1921) describes E. quinquangulare as follows: "Stem short or 0. Leaves 1—2 in. long, narrowed from the 1/4 in. base flat, usually red. Scapes numerous, 3—5 in. long, slender. Heads 1/5 — 1/4 in diam., globular or often conical, black gray or white. Involucre light brown, reflexed. Receptacle hairy; flowers normal; sepals flat.....Central Himalaya, Kumaon; Bengal; Chota Nagpur; Central Provinces; and southwards through the Peninsular India on the plains and the Mysore plateau to Ceylon. Not apparently on the higher levels and not in Burma, except Var. Martiana. I have seen Linnaeus' own type but not of course dissected it and the description is taken from sheets in Herb. Calc. and living plants." He says, further, that it can be distinguished from E. diana Fyson only by the characters of the pistillate sepals. Thirumalachar, Razi, & Swamy (1949) describe the species as "Marsh herbs.....involucral bracts not longer than the floral bracts and the flowers; leaves linear-ensiform, 5—11 nerved, purplish beneath, often drying red; heads globose ovoid, grey or snow-white. Nandi Hills."

It is worth noting here that E. setosum Wight seems to be based on Wight 16. The Petit-Thouars 2, in the Paris herbarium, cited below, is labelled "E. Thouarsii H. Lecomte" and so may very well actually represent the type collection of that species and therefore be from Madagascar. No locality of collection is indicated on the sheet. The Monin s.n., also cited below, was actually examined by and identified as E. quinquangulare by Körnicke himself.

Kunth (1841) cites Herb. Willdenow 2356 and Wight 2365. He also avers that the left-hand "frustulo" on Herb. Willdenow 2359 is "quod certissime E. quinquangulare". He further notes that E. gracile Mart. is hardly distinguishable from E. quinquangulare and comments that "In specimine a Sonneratio in India orientali lecta

sepala 3 exteriora mascula distincta. E. sexangulari affine, sed sat distinctum. — E. pellucidum Mich. huic et E. sexangulari Linn. comparari potest."

The E. argenteum Bong., referred to in the synonymy above, is actually a synonym of Paepalanthus argenteus (Bong.) Körn., and E. triangulare L. is now known as Paepalanthus triangularis (L.) Körn. The E. quinquangulare accredited to Heyne is actually E. cristatum Mart., the homonyms credited to Martius and to Willdenow are E. sollyanum Royle, while the one credited to Wallich is E. nepalense Prescott; E. quinquangulare Bojer is still not satisfactorily placed.

The E. setaceum L., also referred to above, is a valid species, with the homonyms accredited to Crantz and to Wallich as synonyms, while the homonym credited to Bentham is E. bifistulosum Van Heurck & Muell.-Arg., that credited to "Auct." is E. intermedium Körn., that credited to Heyne is E. sexangulare L., those ascribed to Rottler and to Willdenow are E. cinereum R. Br., and that credited to Loureiro is Fimbristylis setacea Benth. in the Cyperaceae.

Lourteig (1966) tells us that the polynomial, Germen junceum Chamaemeli capitulis, aphyllis, is based on P. Hermann 154, in part — this number being a mixture with Panicum dimidiatum L. and Hottonia indica L.

Regarding the E. quinquangulare of Bojer, referred to above, Punt (1964) says "Misinterpreted by Bojer. According to Moldenke there are 3 species of Eriocaulon at Mauritius; E. longifolium Nees ex Kunth, E. johnstoni Ruhl., and E. fenestratum Bojer. It is not yet known which one is the species of Bojer."

Crantz (1766) cites "PLVK. alm. T.221.F.7" as the type for his Eriocaulon scabiosa. Martius (1832) cites Plukenet's work as page "366", but this is an error for p. 336. In Plukenet's work (1696) this famous author adds "ex Herbar. Vivo du Boisiano Phytogr. tab. 221, fig. 7. Huic proxime accedit Plantaginella aurea alopecuroides Brasiliana foliis gramineis Breyn. Cent. 1. 108". However, Breyn's plant does not appear to have anything to do with an Eriocaulon and certainly bears no resemblance whatever to E. quinquangulare. For the record, Breyn's original description is repeated here (it is accompanied by an illustration): "Plantaginella aurea alopecuroides brasiliana, foliis gramineis. Cap. L. En ex minimis unam, sed rarissimis charissimisq; nostris plantulis. Radix ejus exigua, mille fibris niveis comata, Foliola multa graminea & anhunga Graminis Luzulae minoribus Johanni Bauhino, sed omnino glabra, in orbem diffundens: ex quorum gremio, coliculi quinquaginta vel plures prosiliunt, tenuissimi, plantae exilitatem Globulis oblongiusculis lanuginosisque, Plantaginis angustifoliae paniculis Lagopi minoribus, uberrime compensantes, singuli, singulis coliculis triuncialibus

vel brevioribus insidentes, compositi ex pilis lenissimis leuco-phaei coloris, inter quos Flosculi flavi permixti, Summa amoenitate, veluti punctula aurea, emicant, quod jocundissimum, huic Plantulae in Brasilia vigenti, aspectum conciliat."

Martius (1832) comments about E. pellucidum Michx. in his discussion of E. quinquangulare, saying "e speciminibus americanis huic et insequenti [E. sexangulare] comparari potest". He and Wallich (1832) both regarded E. trilobum Hamilt. as a synonym of E. quinquangulare, but this name is now placed in the synonymy of the very similar E. sollyanum Royle. Thwaites & Hooker (1864) place E. argenteum Mart. in the synonymy of what they called E. quinquangulare var. argenteum Thwaites (which is now called E. walkeri Hook. f.).

Jackson (1893) and other authors give "1854" as the date of publication for E. erythropodum Miq., but actually pages 129--799 of Linnaea, volume 27, were not issued until 1856. The initial letter of the specific epithet of E. quinquangulare is underlined by Dalzell & Gibson (1861), and by other authors, for no apparent valid reason.

Begum (1969) gives an interesting summary of the embryology of this species: "The unisexual flowers are borne on a terminal globose head. The development of floral parts is acropetal. The hypodermal archesporium in the anther is 1--2-celled. The wall of the mature anther is 4-layered; the innermost of these layers functions as the glandular tapetum. The macrospore tetrads are of isobilateral and decussate types. A well-developed stomium is present. The pollen grains are generally shed at the 2-celled stage. The tenuinucellar ovules are bigamic and pendulous. The primary archesporium is hypodermal and functions directly as the megasporocyte. The megaspore tetrads are of linear, obliquely linear and T-shaped type. The chalazal megaspore is functional and develops into a Polygonum type embryo sac. The antipodals form the most conspicuous part of the embryo sac and are linear in arrangement. Endosperm is free nuclear and becomes cellular later. Embryo development is of the asterad type."

The usual redness of the leaves of this species is particularly well seen on the Falconer 1194, Ramaswamy 1738 & 2125, Sedgwick & Bell 5091, G. Thomson s.n., Thwaites 792, and Wight 2367 & 2367F collections, cited below.

In addition to the various Bot. Surv. India herbarium numbers referred to above, Panigrahi cites 11876.

Material has been misidentified and distributed in herbaria under the names E. gracile Mart., E. hexangulare L., and E. sollyanum Royle. On the other hand, the Herb. Zuccarini s.n., distributed as E. quinquangulare, is actually E. cinereum R. Br., E. J. Schmidt 250 & 302a are E. diana Fyson; Strachey & Winterbottom 6 is E. gracile Mart.; D. I. Jeffrey 5096 is E. laosense Moldenke; W. Griffith 5564 and R. Wight 2855 are E. odoratum Dalz.; Meebold

9737 is E. polycephalum Hook. f.; Ezekiel 30361, Lisboa s.n., and R. Wight 2367N are E. sollyanum Royle; and Boesa 7468 is E. truncatum Hamilt.

Additional citations: SIERRA LEONE: Afzelius s.n. [Sierra Leone] (S). REUNION: Monim s.n. [Ile Bourbon, 1833] (P). INDIA: Bihar: Dahlstrand s.n. [2.10.1952] (Go). Bombay: P. V. Bole 503 (Xa); Santapau 11755 (Xa); Sedgwick & Bell 5091 (N, Xa). Madras: E. W. Erlanson 5621 (M1). Mysore: S. N. Ramaswamy 3 (Rf), 18 (Rf), 1738 (Lw), 2125 (Lw); G. Thomson s.n. [Maison & Carnatic] (Br, Mu--226, N). Orissa: Waring 4 (Z). State undetermined: Falconer 1194 (T); Herb. Heyn 12 (Br, N); Hügel s.n. [India orientalis] (Mu--224), s.n. [mont. Himal.] (Mu--225); R. Wight 15 (Br), 16 (Br, N), 2367 (N), 2367F (N, N), 2855 [Peninsula Indiae Orientalis] (Mu--341, Mu--343), s.n. [Ind. or.] (V--41341, V--159841). CEYLON: Gardner s.n. [Colombo, Aug. 26th 1820] (B); Macrae 123 (Br); Thwaites 792 (Br, N). THAILAND: Hansen, Seidenfaden, & Smitinand 10817 (Cp, Z), 10818 (Ac, Cp). LOCALITY OF COLLECTION UNDETERMINED: Herb. Mus. Paris s.n. [Cayenne?] (P); S. Kurz s.n. [Ind. or. Bengala? Andamans? Malayae?] (Mu--314), s.n. (Mu-313); Petit-Thouars 2 (P).

ERIOCAULON QUINQUANGULARE var. MARTIANUM Wall.

Synonymy: Eriocaulon martianum Wall., Numer. List 245, hyponym. 1832. Eriocaulon quinquangulare var. martiana Wall. ex Fyson, Journ. Indian Bot. 2: 204. 1921.

Bibliography: Wall., Numer. List 245. 1832; Fyson, Journ. Indian Bot. 2: 204 & 260. 1921; Moldenke, Résumé 165, 291, & 482. 1959; Moldenke, Phytologia 18: 53. 1968.

Martius, on the label of the type collection in the Brussels herbarium, notes "Eriocaulon argenteum Mart. forma E. quinquangulare L. proliferata". Fyson (1921) describes the variety as "Involucral bracts much longer than the floral and extending about 1-1/4 inch beyond the head. Burma. Hooker in F. B. I. called this plant a proliferous state of E. quinquangulare, But the plant with this number in the Calcutta Herbarium is not proliferous." The variety is based on Wallich 7279 from somewhere in Burma. Fyson also tells us that E. dianae var. longibracteatum Fyson "corresponds" to this taxon "and might be considered that plant with one sepal smaller and flat." His "1-1/4 inch beyond the head" is obviously a misprint, but what figure he intended is not clear. Wallich, in his Numerical List (1832), give no locality of collection whatever for his number 7279.

Citations: BURMAL State undetermined: R. Wight s.n. [Wallich 7279] (Br--isotype, N--isotype, N--photo of isotype, Z--photo of isotype).

ERIOCAULON RAVENELII Chapm.

Synonymy: Eriocaulon ravenelli Chapm. ex Moldenke, *Résumé* 291, in syn. 1959. Eriocaulon ravenellii Chapm. ex Moldenke, *Résumé* 291, in syn. 1959.

Additional bibliography: Chapm., *Fl. South. U. S.*, ed. 1, pr. 1, 503 (1860), ed. 1, pr. 2, 503 (1865), ed. 1, pr. 3, 503 (1872), ed. 2, pr. 1, 503 (1883), ed. 2, pr. 2, 503 (1884), ed. 2, pr. 3, 503 (1887), and ed. 2, pr. 4, 503. 1889; Morong, *Bull. Torr. Bot. Club* 18: 355. 1891; A. W. Chapm., *Fl. South. U. S.*, ed. 2, pr. 5, 503 (1892) and ed. 3, 530. 1897; J. K. Small, *Fl. Southeast. U. S.*, ed. 1, 236 (1903) and ed. 2, 236. 1913; J. K. Small, *Fl. Miami* 37--38. 1913; J. K. Small, *Man. Southeast. Fl.* 257 & 258. 1933; Moldenke, *N. Am. Fl.* 19 (1): 19 & 26. 1937; Moldenke, *Phytologia* 1: 322. 1939; Moldenke, *Known Geogr. Distrib. Erioc.* 2, 3, & 39. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 8, 9, & 206. 1949; Moldenke, *Phytologia* 3: 342. 1950; Moldenke, *Résumé* 10, 12, 291, & 482. 1959; Moldenke, *Résumé Suppl.* 2: 9. 1960; Radford, Ahles, & Bell, *Guide Vasc. Fl. Carol.* 106 & 107. 1964; Kral, *Sida* 2: 293--295, 297, & 331. 1966; Shimmers, *Sida* 2: 441. 1966; Moldenke, *Phytologia* 18: 253 & 370. 1969.

Illustrations: Kral, *Sida* 2: 294. 1966.

Morong (1891) notes that "Chapman states that the style is occasionally simple and the seeds minutely pubescent. The specimens which I have examined failed to show either. Wet grounds, S. C." Eyles & Robertson (1944) say for it "Swamps, Coastal Plain, Florida to Mississippi and South Carolina. Apparently the most infrequent of the genus." Radford, Ahles, & Bell (1964) say "in low pinelands, very rare, Berkeley Co., S. C." Kral, in Levy County, Florida, found the species growing "in sandy peat-muck of somewhat brackish edge of marsh in slash pine - saw palmetto flatwoods, the rosettes in exposed areas, the young heads pale, darkening in age, associated with Lipocarpa maculata, Fuirena breviseta, Ludwigia alata, and Eleocharis geniculata, and, in Lee County, "in full sunlight of disturbed area in association with Dichromena colorata, Psilocarya sp., Fimbristylis schoenoides, F. caroliniana, and Fuirena scirpoidea, the young heads straw-colored, the older ones darker."

Kral (1966) gives a very full description of the species and comments as follows: "Mildly acid sandy pineland swamps, particularly on wet disturbed areas toward the Atlantic coast, eastern South Carolina south to Florida, west to Mississippi...Eriocaulon ravenelli appears to be one of the rare species of Eriocaulaceae of the southeastern United States; at least it is scarce in the larger collections. However, it is locally abundant in the lower peninsula of Florida, generally being found on sweeter soils than those occupied by the other Eriocaulons of the area. I have seen it in but three localities and in each case it was growing on moist exposed pine flatwoods sands bordering Typha-Cladium-Spartina marsh near the Florida coast. It actually seems to occupy the ecotone between the two abovementioned vegetational types. It

comes in quickly on disturbed sands or sandy peats but appears not to compete well with the grasses and sedges which also rapidly invade such areas; therefore it does not persist long on a site. It appears to be most abundant on intermittently but shallowly flooded sands and, where I have seen it, is associated with such herbs as Cyperus flavescens, C. haspan, C. odoratus, C. polystachos var. texensis, Lipocarpa maculata, Hemicarpha micrantha, Eleocharis albida, E. geniculata, E. atropurpurea, Fimbristylis caroliniana, F. diphylla, F. schoenoides, Rhynchospora inundata, R. microcarpa, R. schoenoides, R. tracyi, Dichromena colorata, Fuirena breviseta, F. scirpoidea, Psilocarya nitens, P. schiediana, Panicum hemitomon (and several Dichanthelium panicums), Manisuris rugosa, Juncus megacephalus, J. scirpoides, Asclepias lanceolata, Proserpinaca pectinata, Amannia latifolia, Lythrum lanceolatum, Rhexia cubensis, Sabatia grandiflora, Hydrolea corymbosa, Litrisa carnosae, Liatris garberi, Flaveria linearis, Coreopsis leavenworthii and Cacalia lanceolata, etc. Even when present in abundance E. ravenelii is seldom conspicuous, being a low plant and lacking the startling white masses of trichomes possessed by some of the other Eriocaulons. Both in habit and in its ecology it appears to be very similar to E. parkeri, a coastal species further north, this fact commented on some time ago by B. L. Robinson (1903). While all descriptions of this species contain no definitive statement about trichomes, there are some examples in which a very few trichomes are present on bractlets and perianth parts. When such do appear, they are similar in shape, size and colour to those of E. lineare."

I might add, parenthetically, that my own experience with this species has been that it was not even seen until I bent on my knees to collect some other plants growing with it and completely obscuring it.

It has been collected in flower and fruit in November. Material has been misidentified and distributed in herbaria as E. parkeri B. L. Robinson and Lachnocaulon glabrum Körn. On the other hand, the C. R. Bell 219, distributed as E. ravenelii, is actually Lachnocaulon anceps (Walt.) Morong, Bright 3842 is Lachnocaulon eciliatum Small, Fassett 19914 is Lachnocaulon engleri Ruhl., and Meebold 28102 is Lachnocaulon glabrum Körn.

Additional citations: SOUTH CAROLINA: County undetermined: M. A. Curtis s.n. [S. Car. 1848] (E); Ravenel s.n. [S. C.] (Ms--15480). FLORIDA: Dade Co.: A. A. Eaton 176 (Rf). Lee Co.: Kral 22923 (N). Levy Co.: Kral 22940 (N). Palm Beach Co.: A. R. Moldenke 1383 (Z). County undetermined: A. P. Garber s.n. [S. Florida, 1877] (Ms--15500, N).

ERIOCAULON RECURVIFOLIUM C. H. Wright

Bibliography: C. H. Wright, Kew Bull. Misc. Inf. 1919: 264. 1919; Moldenke, Résumé Suppl. 17: 4. 1968.

The type of this species was collected by Hyacinthe Vandereyst (no. 3133) in the Republic of the Congo.

ERIOCAULON REDACTUM Ruhl.

Synonymy: Eriocaulon dubium Körn. ex Moldenke, Résumé Suppl.

1: 17, in syn. 1959.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 13, 104, 113, & 287. 1903; J. R. Perkins, Fragm. Fl. Philipp. 1: 136. 1904; Prain, Ind. Kew. Suppl. 3: 70. 1908; Fyson, Journ. Indian Bot. 3: 16. 1922; Moldenke, Known Geogr. Distrib. Erioc. 23 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 127 & 206. 1949; Moldenke, Résumé 162 & 482. 1959; Moldenke, Résumé Suppl. 1: 17 (1959), 3: 17 & 20 (1962), 13: 5 (1966), and 15: 8. 1967; Moldenke, Phytologia 18: 302. 1969.

It appears that Körnicke intended to apply the name E. dubium to the very same Stocks, Law, &c. s.n. [Malabar, Concan] specimen in the Berlin herbarium which was chosen later by Ruhl and as the type of his E. redactum. The species has been found growing at 1300 meters altitude. Smitinand describes it as an "herb common in wet places" in Thailand, with blackish flowers, blooming in July. Perkins (1904) avers that it is related to E. merrillii Ruhl.

Material has been misidentified and distributed in herbaria as E. cinereum R. Br., E. sexangulare L., and Cyperus tenuispicatus Bock.

Citations: INDIA: Bombay: Hohenacker 131b (Ut—316); Stocks, Law, &c. s.n. [Malabar, Concan, &c.] (B—type, C—isotype, S—isotype, Ut—317—isotype, Z—isotype). Kerala: Hohenacker s.n. [Mangalore] (Mu—296). Mysore: S. N. Ramaswamy 22 (Rf). West Bengal: Bernet 1040 (Ac). State undetermined: R. Wight 2366 (B, C). THAILAND: Smitinand 5852 [Roy. Forest Dept. 23734] (Bk).

ERIOCAULON REGNELLII Moldenke

Bibliography: Moldenke, Phytologia 3: 35—36. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 77 & 206. 1949; Moldenke, Phytologia 3: 342. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 89 & 482. 1959.

Irwin, Maxwell, & Wasshausen describe this species as a caespitose plant, with gray flowing heads, growing in wet ground on sandy slopes and outcrops, at 1500 meters altitude, flowering in February.

Additional citations: BRAZIL: Minas Gerais: Irwin, Maxwell, & Wasshausen 19687 (Rf); Regnell III.1740 (S—isotype, S—isotype).

ERIOCAULON REMOTUM H. Lecomte

Bibliography: H. Lecomte, Bull. Soc. Bot. France 55: 643 & 644. 1909; Prain, Ind. Kew. Suppl. 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; Moldenke, Known Geogr. Distrib. Erioc. 20 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 111 & 206. 1949; Bourdu, Bull. Soc. Bot. France 104: 158. 1957; Moldenke,

Résumé 136 & 482. 1959.

ERIOCAULON RITCHIEANUM Ruhl.

Synonymy: Eriocaulon horsley-kondae Fyson, Journ. Indian Bot. 1: 52. 1919. Eriocaulon horsely-kundae Fyson, Fl. Nilg. & Puln. Hill-tops 3: 119. 1921. Eriocaulon horsley-kundae Fyson, Journ. Indian Bot. 3: 13-14, pl. 43. 1922. Eriocaulon horsleykondae Fyson apud C. E. C. Fischer, Kew Bull. Misc. Inf. 1931: 261. 1931. Eriocaulon horsleykundae Fyson ex Moldenke, Résumé 289, in syn. 1959. Eriocaulon horsleykonsae Fyson ex Moldenke, Résumé Suppl. 18: 11, in syn. 1969.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 61, 73, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Fyson, Journ. Indian Bot. 1: 52 (1919) and 3: 13-14, 16, & 18, pl. 43. 1922; A. W. Hill, Ind. Kew. Suppl. 6: 78. 1926; C. E. C. Fischer, Kew Bull. Misc. Inf. 1931: 261. 1931; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1611-1612 & 1619. 1931; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23, 35, & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 127 & 206. 1949; Moldenke, Phytologia 3: 342. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1123, 1127, & 1333. 1956; Razi, Rec. Bot. Surv. India 18: 20. 1959; Moldenke, Résumé 162, 289, & 482. 1959; Thanikaimoni, Pollen & Spores 7: 185. 1965; S. V. Ramaswami, Study Flow. Pl. Bangalore [thesis] 219, 223, & 1407. 1966; Moldenke, Phytologia 18: 264 & 310. 1969.

Illustrations: Fyson, Journ. Indian Bot. 3: pl. 43. 1922.

Material of this species has been misidentified and distributed in herbaria as E. cristatum Mart. and as E. minutum Hook. f. On the other hand, the Meebold 9735 and Nusrath 39, distributed as E. ritchieanum, are actually E. leucomelas Steud.

Additional citations: INDIA: Bombay: Ritchie 1248 (B-type); Santapau 10904 (Xa). Mysore: Cheluviah 56 (Bn-3101); S. V. Ramaswami 1359 (Z).

ERIOCAULON ROBINSONII Moldenke

Bibliography: Moldenke, Phytologia 2: 220. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 136 & 206. 1949; Moldenke, Phytologia 3: 342-343. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 88. 1953; Moldenke, Résumé 176 & 482. 1959.

Collectors have found this plant growing in damp places on dunes. Material has been misidentified and distributed in herbaria under the name E. sieboldianum Sieb. & Zucc. The Clemens & Clemens 3275, cited below, is a mixture with something non-ericaulaceous.

Additional citations: INDOCHINA: Annam: Clemens & Clemens 3275, in part (Ca-340779, M1, Ut-89a); Pételot 8075 (N), 8970 (N); Squires 91 (Ca-307312).

ERIOCAULON ROBUSTIUS (Maxim.) Mak.

Synonymy: Eriocaulon alpestre & robustius Maxim. ex Mak., Bot. Mag. Tokyo 4: 174, nom. nud. (1890); Diagn. Pl. Nov. As. 8: 25. 1893. Eriocaulon alpestre var. robustius Maxim. ex Mak., Bot. Mag. Tokyo 8: 506. 1894. Eriocaulon robustium Mak., Journ. Jap. Bot. 3: 26. 1926. Eriocaulon robustius Mak. apud A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933. Eriocaulon alpestre Ruhl. apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 46 & [86], in syn. 1940 [not E. alpestre Hook. f. & Thoms., 1867]. Eriocaulon buergerianum Miyabe & Kudô apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 47 & [86], in syn. 1940 [not E. buergerianum Körn., 1867]. Eriocaulon buergerianum Nemoto apud Satake in Nakai & Honda, Nov. Fl. Jap. 6: 47 & [86], in syn. 1940. Eriocaulon robustum Mak. ex Moldenke, Résumé Suppl. 1: 18, in syn. 1959 [not E. robustum Steud., 1855]. Eriocaulon alpestre var. robustius Nakai ex Moldenke, Résumé Suppl. 17: 9, in syn. 1968.

Additional & emended bibliography: Mak., Bot. Mag. Tokyo 4: 174. 1890; Maxim., Diagn. Pl. Nov. As. 8: 25. 1893; Mak., Bot. Mag. Tokyo 8: 506. 1894; J. Matsumura, Ind. Pl. Jap. 2 (1): 175. 1905; Nakai, Bot. Mag. Tokyo 25: [220], fig. C. 1911; Mak., Journ. Jap. Bot. 3: 26. 1926; Mak., Nippon Shokubatsu 725. 1926; Komarov & Alis., Opred. Rast. Dal'nevost. Kr. 1: 340, pl. 105. 1931; Mak. & Nemoto, Fl. Jap., ed. 2, 1514. 1931; Miyabe & Kudô, Fl. Hokk. & Saghal. 3: 287. 1932; A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933; Steinberg in Komarov & Schischkin, Fl. U. S. S. R. 3: 497, pl. 27, fig. 4 a & b. 1935; Nemoto, Fl. Jap. Suppl. 1038 & 1039. 1936; Hara, Bot. Mag. Tokyo 52: 401. 1938; Honda, Nom. Pl. Jap. 462. 1939; Satake, Journ. Jap. Bot. 15: 629. 1939; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] 33—36. 1940; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 9, 13, 46—48, 65, 74, 79, [86], & 87, fig. 4A & 20. 1940; Mak., Illustr. Fl. Jap. 772 & E.26, fig. 2314. 1940; Moldenke, Known Geogr. Distrib. Erioc. 25, 39, & 61. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 108, 130, 133, 134, & 206. 1949; Moldenke, Phytologia 3: 343. 1950; Koyama, Philip. Journ. Sci. 84: 367—368. 1956; Moldenke, Résumé 132, 167, 171, 173, 285, 286, 291, 292, & 482. 1959; Moldenke, Résumé Suppl. 1: 12 & 18 (1959) and 3: 17, 18, & 21. 1962; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 183, 184, 429, & 430, fig. 125 (3), pl. 48, fig. 309. 1964; Steinberg in Komarov & Schischkin, Fl. U. S. S. R., Engl. transl., 3: 394. 1964; Moldenke, Résumé Suppl. 17: 9 & 10. 1968; Moldenke, Phytologia 17: 386 (1968) and 18: 77, 80, 182, 300, & 311. 1969.

Illustrations: Nakai, Bot. Mag. Tokyo 25: [220], fig. C. 1911; Komarov & Alis., Opred. Rast. Dal'nevost. Kr. pl. 105. 1931; Steinberg in Komarov & Schischkin, Fl. U. S. S. R. 3: pl. 27, fig. 4 a & b. 1935; Mak., Illustr. Fl. Jap. fig. 2314. 1940; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 9 & 47, fig. 4A & 20. 1940; Koyama in Kitamura, Murata, & Koyama, Col. Illustr. Herb. Pl. Japan 3: 183, fig. 125 (3), pl. 48, fig. 309. 1964.

Koyama (1956) cites the original Maximowicz publication referred

to in the bibliography above as "1892"; his own paper is sometimes cited as "1955", but was not actually issued until 1956.

Recent collectors have found this plant growing in rice puddles and rice fields, flowering and fruiting from July to November. Utsumi says "abundant in rice puddles", but Koyama says "occasional in rice puddles". Tsang found it "abundant in sandy soil of swamps and rice terraces". Popular names recorded for it are "hiroha-immohige", "hirohano-immohige", "hirohano-immohige", "immohige", and "kuro-immohige".

Material has been misidentified and distributed in herbaria under the names E. atrum Nakai, E. miquelianum Körn., E. robustum var. nigrum Satake, E. sexangulare L., E. sieboldianum Steud., and E. truncatum Hamilt. The Furuse s.n. [Hirataki-muma, 19 Sept. 1955], cited below, is a mixture with E. hondoense Satake; Furuse s.n. [Sara-muma, 6 Oct. 1955] is said by Koyama to represent a hybrid (unnamed) between E. robustum and E. hondoense, but I fail to see the evidence for this.

Satake (1940) states that E. robustum grows in "Manchuria, China (?), Siberia" and cites the following collections: KOREA: Boku 139 & 141; Faurie 893; Nakai s.n. [Aug. 1916]; Uchiyama s.n. [Sept. 1902]. KOREAN COASTAL ISLANDS: Quelpart: Faurie 1430; Taquet 1516. WESTERN PACIFIC ISLANDS: JAPAN: Hiratozima: Kawati s.n. [Nov. 1925]. Hokkaido: Akiyama 3289; Faurie 8671; Hara s.n. [1933]; Yamamoto s.n. [Oct. 1925]. Honshu: Akiyama 4910; Andô 32; Collector undetermined 32725 & s.n. [Mukoogaoka-mura]; Faurie 1327, 1868, 1871, 7218, & s.n. [Oct. 1886]; Habuta s.n. [1928]; Hasimoto 44198, 57470, & s.n. [Sept. 1910]; Hisamatu s.n. [Sept. 1895]; Itô s.n. [Oct. 1893]; Iwabuti 5367 & 5439; Katô s.n. [1931]; Kinashi s.n. [Sept. 1908]; Kinouti 44702; Koidzumi 10559, 10683, 24562, 24563, 34364, 52470, & 52471; Kudô 26186; Kurosawa s.n. [Sept. 1928]; Maekawa s.n. [Oct. 1936]; Matsumura s.n. [Oct. 1879], s.n. [Sept. 1880], & s.n. [Sept. 1885]; Misono 52705; Nagasawa 54433 & 57464; Naohara s.n. [Sendai]; Nakai s.n. [Nov. 1936]; Nakazima s.n. [Oct. 1928]; Nikai 49456; Ohwi & Tagawa s.n. [Sept. 1931]; Okamoto s.n. [Oct. 1932]; Okuyama 24; Satake s.n. [Oct. 1936]; Sugimoto s.n. [Oct. 1927]; Takagi 35028; Tasiro s.n. [Sept. 1927] & s.n. [Oct. 1930]; Tiba s.n. [Itinoseki]; Tuboi s.n. [Oct. 1930]; Turumati 14; Watanabe s.n. [Sept. 1899]. Kyushu: Doi 63; Kozuma 23130; Nabesima 8; Nakasima 18883 & s.n. [Oct. 1936]; Ogata s.n. [Iwata-mura]; Takagi s.n. [Aug. 1934]; Tasiro 29999, in part, & 43768, in part. Shikoku: Faurie 11854 & 11856; Murai 9; Ogata 329; Oti 3; Watanabe s.n. [Sept. 1894]; Yamaguti 8; Yamamoto s.n. [Sept. 1913]; Yamasita s.n. [Oct. 1930]. RYUKYU ISLAND ARCHIPELAGO: SATSUNAN ISLANDS: Tanegasima: Tasiro s.n.

Additional & emended citations: UNION OF SOCIALIST SOVIET REPUBLICS: Far Eastern Republic: Kusnezow 4 (N); Melvil s.n. [31/VIII/1926] (S). CHINA: Fukien: Chang & En 2907 (Ca-299603). Kwangtung:

W. T. Tsang 20687 (Ca-611685). Shantung: Faber s.n. [Chefoo] (V-989). KOREA: Tomiyama s.n. (Kg). KOREAN COASTAL ISLANDS: Quelpart: Taquet 1540 (B), 3366 (S), s.n. [15 Oct. 1907] (V-1343). WESTERN PACIFIC ISLANDS: JAPAN: Honshu: Collector undetermined s.n. [Komaba bei Tokyo, 7/10/07] (S); Furuse 2 (Ss), 19850 (S), s.n. [Nagamma, 29 Sept. 1953] (S), s.n. [Makino Oganaka-mura, 29 Sept. 1953] (S), s.n. [Hirataki-mura, 19 Sept. 1955] (S), s.n. [Gyoonin-bara, 27 Sept. 1955] (S, S, S), s.n. [Aburado, 28 Sept. 1955] (S), s.n. [Oh-nagura, 29 Sept. 1955] (S), s.n. [Sara-numa, 6 Oct. 1955] (S), s.n. [2 July 1956] (S), s.n. [16 Oct. 1956] (S, S), s.n. [28 Sept. 1957] (S); C. Hashimoto 850 (B, Ca-55789, Go, Mg, N, S); Herb. Sci. Coll. Imp. Univ. s.n. [Musashi, Oct.] (Vt); Iishiba s.n. [Arahama, 24/10/1926] (Ca-342483, S), s.n. [Sendai, Sep. 30, 1928] (Go); Kawagoe 509 (Kg), s.n. [30 Sept. 1906] (Kg); Kirino 418 (S); T. Koyama 13101 (Z), s.n. [13 October 1954] (Ss); Naito s.n. [Nov. 6, 1932] (Kg); Ohmura s.n. [25 Sept. 1955] (Ss); Tagawa s.n. [29.IX.1931] (Ac, Ws); Togasi 915 (B, Ca-21964, Go, Mg, N, S); Utsumi 223 (Ss); Uyezuki s.n. [Sept. 5, 1912] (Kg). Kyushu: Kodama 218 (Kg).

ERIOCAULON ROBUSTIUS var. NIGRUM Satake

Synonymy: Eriocaulon alpestre var. nigrum (Satake) Koyama, *Philip. Journ. Sci.* 84: 368. 1956.

Bibliography: Satake, *Journ. Jap. Bot.* 27: 268. 1952; Koyama, *Philip. Journ. Sci.* 84: 368. 1956; Moldenke, *Résumé* 173, 285, & 482. 1959; Moldenke, *Phytologia* 17: 386. 1968.

The Furuse s.n. [Aburado, 28 Sept. 1955], distributed as var. nigrum, seems to be typical E. robustius (Maxim.) Mak.

ERIOCAULON ROBUSTIUS var. PERPUSILLUM (Nakai) Satake

Synonymy: Eriocaulon alpestre var. perpusillum Nakai, *Bot. Mag. Tokyo* 24: 6. 1910. Eriocaulon robustius var. perpusillum Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 13, 48, & 87. 1940.

Bibliography: Nakai, *Bot. Mag. Tokyo* 24: 6. 1910; Mak. & Nemoto, *Fl. Jap.*, ed. 1, 1303 (1925) and ed. 2, 1510. 1931; Nemoto, *Fl. Jap. Suppl.* 1038. 1936; Honda, *Nom. Pl. Jap.* 461. 1939; Satake, *Journ. Jap. Bot.* 15: 629. 1939; Satake in Nakai & Honda, *Nov. Fl. Jap.* 6: 13, 43, 48, [86], & 87. 1940; Satake, *Bull. Tokyo Sci. Mus.* 4: [Rev. Jap. Erioc.] 36. 1940; Moldenke, *Known Geogr. Distrib. Erioc.* 25 & 61. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 134 & 206. 1949; Moldenke, *Résumé* 173, 285, & 482. 1959; Koyama in Kitamura, Murata, & Koyama, *Col. Illustr. Herb. Pl. Jap.* 3: 184 & 430. 1964; Moldenke, *Résumé Suppl.* 17: 10. 1968.

This variety differs from the typical form of the species in being very dwarf in stature, the calyx-tube of the staminate florets being very short, and the free portions of the sepals of the pistillate florets being larger.

The type of the variety was collected by N. Kinasi at Aomori, in

Mutu province, Honshu, Japan, in September, 1903, where the variety is said to be endemic. The only vernacular name recorded for it is "tyabo-imunohige".

ERIOCAULON ROBUSTO-BROWNIANUM Ruhl.

Synonymy: Eriocaulon mysorense Fyson, Kew Bull. Misc. Inf. 1914: 331. 1914. Eriocaulon rhodae Fyson, Journ. Indian Bot. 1: 50, nom. nud. (1919) and 2: 264 & 266. 1921.

Bibliography: Ruhl. in Engl., Pflanzenreich 13 (4-30): 62, 77, & 287. 1903; Prain, Ind. Kew. Suppl. 3: 70. 1908; Fyson, Kew Bull. Misc. Inf. 1914: 331. 1914; Fyson, Journ. Indian Bot. 1: 50 (1919) and 2: 264 & 266, pl. 18. 1921; Prain, Ind. Kew. Suppl. 5, pr. 1, 97. 1921; A. W. Hill, Ind. Kew. Suppl. 6, 79 (1926) and 7: 89. 1929; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1609-1610 & 1619. 1931; Razi, Journ. Mysore Univ. 7 (4): 77. 1946; Moldenke, Known Geogr. Distrib. Erioc. 23, 37, & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 126, 127, 205, & 206. 1949; Moldenke, Phytologia 3: 343. 1950; Razi, Journ. Mysore Univ. 11 (1): 7. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1122, 1127, & 1333. 1956; Moldenke, Résumé 162, 165, 291, 294, & 482. 1959; Razi, Rec. Bot. Surv. India 18: 20. 1959; Prain, Ind. Kew. Suppl. 5, pr. 2, 97. 1960; Moldenke, Résumé Suppl. 3: 17 (1962), 6: 8 (1963), and 11: 5. 1964; Thanikaimoni, Pollen & Spores 7: 185. 1965; Moldenke, Résumé Suppl. 14: 8. 1966; K. Larsen, Dansk. Bot. Ark. 23: 375-399. 1966; Ornduff, Reg. Veg. 55: 13 & 118. 1968.

Illustrations: Fyson, Journ. Indian Bot. 2: 265 & pl. 18. 1921.

The type of this perplexing species was collected by John Sutherland Law in the Dharwar and Bellary Districts, Bombay, India, and was originally misidentified and distributed in herbaria as Ameletia floribunda Wight. Ruhl. (1903) unfortunately misspelled the collector's surname "Saw". Recent collectors have found the species growing at 3000 feet altitude, flowering and fruiting in November and December. Santapau states that it grows in Kerala. Bole describes it as an "herb 1-1.5 feet tall, heads white, very common in the clearings". Larsen (1966) reports the chromosome number as $2n = ca. 110$.

It is important to repeat here Fyson's (1921) descriptions of E. robusto-brownianum and of what he called E. rhodae: "E. robusto-brownianum Ruhl. (Law in Canara, Dharwar, and Bellary in Herb. Calc.!).....Size and habit of the last species [E. brownianum Mart.] but leaves half as long as the scapes. Floral bracts acuminate, very white because covered with thick white hairs, giving the head a white echinulate appearance. Female petals hairy, narrow at the base, with large glands.....Peninsular India, Western Mysore and Kanara. A very striking plant because of the white acuminate floral bracts. There are no sheets exactly like it from Burma of the Malay, but the species re-appears in Yunnan (Dr. Henry) in a smaller form. Wall. Cat. 6967 B, described by me in Kew Bulletin 1914 as E. mysorense sp. nov. is I think this species. [I

had not then seen Ruhland's type quoted above, but I have not seen Wallich's sheet again to compare with the type).....E. Rhodae Fyson, sp. nov. (Fyson 9696 in Herb. Madras) Caulis perbrevis. Folia isdem sp. E. nilagirensis similis Pedunculi plures 15—30 cm. Capitula globosa 1.2—2 cm. Bractae involucentes reflexae. Bractearum flores superantium inferiores albae, acutae; superiores quomodo nigrescentes, dorso pubescentes. Receptaculum villosum. Flores trimeres flos ♀ longi-pedicellata, sepala aequalia, navicularia, alba, glabra; petala magna, lanceolata, sub-spongiosa, dorso sparsepilosa. Semen rubrum, glabrum. Flos ♂ o breviter pedicellata; antherae nigrae.....Peninsular India; Mysore and Wynaad in water. Remarkable for the white sepals and bracts and for the stalked petals as in E. lanceolatum. Also for the long pedicels of the flowers, especially of the female which are often stalked beyond the male recalling but in reverse, the arrangement of spelets in Andropogon. The scarious floral bracts, very nearly glabrous, distinguish the plant in the field from the other species of the group. In the herbarium the plants are characterized by untidy-looking heads, in great contrast to the very firm neat echinulate heads, of E. robusto-brownianum, which occurs in the same localities."

Material has been misidentified and distributed in herbaria as E. brownianum Mart. and as E. wightianum Mart.

Additional citations: INDIA: Bombay: P. V. Bole 1530 (Xa); Law s.n. [Dharwar & Bellary Districts] (B-type, Z-isotype); Ritchie 1244 (T). Madras: Pichamuthu 95 (Bn—3228). Mysore: Fyson 3664 (S); Iyer S.4 (Bn—3116); Meebold 9730 (S), 9734 (S); S. N. Ramaswamy 1 (Z), 24 (Ac); Shivanna 6 (Bn—3220); M. B. N. Singh s.n. [Mercara, 8.8.50] (Bn—3146). THAILAND: Sørensen, Larsen, & Hansen 6341 (Cp).

ERIOCAULON ROBUSTUM Steud.

Synonymy: Eriocaulon bracteosum Steud., Syn. Pl. Glum. 2: (Cyp.) 272. 1855. Eriocaulon robustum var. foliis nitenti-glaucis Steud., Syn. Pl. Glum. 2: (Cyp.) 271. 1855. Eriocaulon bracteosum var. α C. Müll. in Walp., Ann. 5: 944. 1860. Eriocaulon bracteosum var. β C. Müll. in Walp., Ann. 5: 944. 1860. Eriocaulon robustum Fyson, Journ. Indian Bot. 2: 312, sphalm. 1921.

Bibliography: Steud., Syn. Pl. Glum. 2: (Cyp.) 271 & 272. 1855; C. Müll. in Walp., Ann. 5: 926 & 944 (1860) and 6: 1170 & 1171. 1861; Hieron. in Engl. & Prantl, Nat. Pflanzenfam., ed. 1, 2 (4): 27. 1888; Hook. f., Fl. Brit. Ind. 6: 572. 1893; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 1, 1: 877. 1893; Ruhl. in Engl., Pflanzenreich 13 (4-30): 64, 85, 285, & 287. 1903; Fyson, Fl. Nilg. & Puln. Hill-tops 1: 427—429 (1915) and 2: pl. 272. 1915; Fyson, Journ. Indian Bot. 2: 310—312, pl. 29. 1921; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. 1, 9: 1607 & 1618. 1931; Castell. in Descole, Gen. & Sp. Pl. Argent. 3: 77 & [103]. 1945; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 2, 1: 877. 1946; Moldenke, Known Geogr.

Distrib. Erioc. 23, 33, & 39. 1946; Moldenke, Known Geogr. Dis-trib. Verbenac., [ed. 2], 127 & 206. 1949; Moldenke, Phytologia 3: 343. 1950; C. E. C. Fischer in Gamble, Fl. Presid. Madras, ed. repr. 2, 8 [3]: 1121, 1126, & 1333. 1956; Moldenke, Résumé 162, 286, & 482. 1959; Moldenke, Résumé Suppl. 1: 18. 1959; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 877. 1960; Thanikaimoni, Pollen & Spores 7: 185. 1965.

Illustrations: Fyson, Fl. Nilg. & Puln. Hill-tops 2: pl. 272. 1915; Fyson, Journ. Indian Bot. 2: 311 & pl. 29. 1921.

Eriocaulon robustum is based on Hohenacker 1307 as type, the var. foliis nitenti-glaucis is typified by Hohenacker 1309, and E. bracteosum is based on Hohenacker 1308.

Müller (1860) divides this species into two varieties as follows: "var. α . foliis lanceolatis elongatis, 8—14 1/2 pollices longis. Eriocaulon robustum et var. foliis nitenti-glaucis Steudel Synops. 2. 271 (v. s.). var. β . foliis oblongo-lanceolatis, 2—3 1/2 pollices longis. Eriocaulon bracteosum Steudel Synops. 2. 272. India orientalis: var. α . In montibus Nilagiri ad rivulos prope Utacamund (Incolis: Dabbe) Martio leg. Metz n. 1307 et 1309 (Hb. Steudel). — var. β . Leg. Huegel (Hb. Vindob. et Zuc-carini). In montibus Nilagiri leg. Metz n. 1308 (Hb. Steudel). — Species propter capitula floribus laxis magnis composita et pilis longis sub lente visis subcrystallino-nitentibus insignis. Inter varietas robusti veri ab auctore ipso pronunciatas non vidi discrimen."

It should be noted here that the E. robustum var. caulescens (Hook. f. & Thoms.) Fyson is regarded by me as a synonym of E. atratum var. major Thwaites.

Fyson (1921) describes E. robustum as follows: "Stem short and stout to as much as 1 in. in thickness: thinner and branched in var. b [= E. atratum var. major]. Ls. up to 12 in. by 2 in., many nerved, glossy, coriaceous. Scapes to 24 in. Heads 1 1/4 in. Involucre white or gray. Floral bracts acute, ciliate, entirely hidden when these are fully out by the very large protruding male petals. Receptacle hour-glass shape.....South India; Nilgiris 5—6,000 ft." What Fyson means by "Ls. up to 12 in. by 2 in." I do not know; it is obviously an error in the use of systems of measurement abbreviations.

In his 1915 work, Fyson goes into far more detail: "F. B. I. vi 572; I 4; White-tailed Hatpin-flower, Chrysanthemum scented. Rootstock stout, as thick as the finger or thicker, sometimes creeping, densely clothed below with the dead leaves: Leaves usually 3 or 4 inches long (1 to 9), and narrowed gradually from a clasping base, 1 inch broad, to the obtuse end, lanceolate or oblanceolate, quite glabrous, finely striate with only very small and close cross nerves, firmly erect or spreading, in section boat-shaped without keel, of a fresh light green or bluish colour. Flower stems solitary; about a foot high (8 inches to 3 feet); finely ribbed and twisted; sheath rather longer than the leaves,

expanded 1/2 inch below the mouth, which may be split down one side 1/2 inch or more. Heads 1/2 to 3/4 inch broad, and not quite so high; usually broadest near the top with sloping sides and so narrower at the bottom; covered when the flowers are out with the long white; downward directed, petals of the male flowers; except, often, in a band above the base, so that the head has a waist and approaches the form of a very flat hour glass; very slightly scented like Chrysanthemum. Involucral bracts many-seriate, ovate, acute, glabrous or with a very few short hairs, scarious, olive-black in colour. Receptacle villous, more or less hollowed at the top. Floral bracts, obovate-lanceolate-deltoid, fringed at the top with white hairs. Male flowers: — Sepals connected only at the base, much the same in shape as the floral bracts, with white hairs on the back. Petals connected into a distinct tube, oblanceolate, hairy, one much longer than the other two and the bract, and more hairy, all three with a black gland on the inner face a little above the mouth of the tube. Stamens six; anthers black on slender, curved filaments. Female flowers: — Stalk shorter. Sepals and petals with long hairs at the base, in addition to the terminal fringe of thicker ones at the back: sepals free: petals oblanceolate, quite free, all equal in length, with black glands. Ovary of three cells, yellow: styles long connected only near the base. t. 272. b. bracts; r receptacle in section; s three stamens. On the bank of the river at Pykara. Fyson 2561, 2694, 2860. Coonoor (Clarke). Only known from the Nilgiris. The slight enlargement of the sheath just below the mouth is not mentioned in the descriptions in F. B. I. and Das Pflanzenreich, but seems distinctly characteristic; so also is the frequent narrowing of the head above the base, by the greater length of the long petals of the male flowers in the upper and the lowest circles. The flower-head has none of the strong honey scent of E. nilagirensis, but the faintest trace of that of the Chrysanthemum."

The species has been collected in flower and fruit in March and April. The only vernacular name recorded is "dabbe".

Additional citations: INDIA: Bombay: C. McCann 50177 (N, Xa), 50178 (N, Xa); Santapau 10850 (Xa). Madras: Bembower 35 (Mi); Fyson 2564 (S); Hohenacker 1307 (Mu—231—iso-type); Hooker f. & Thomson s.n. [Nilghiri] (B); Schmid 820 (B), 824 (B); R. Wight s.n. [Nilgherry Hills] (V—41252). State undetermined: Hügel s.n. [Ind. orient.] (Mu—232); R. Wight 2860 [Peninsula Indiae orientalis] (Mu—338), s.n. [Ind. or.] (V—41340).

ERIOCAULON ROCKIANUM Hand.-Mazz.

Synonymy: Eriocaulon rockii Moldenke, *Phytologia* 2: 219—220. 1947.

Bibliography: Hand.-Mazz., *Symb. Sin.* 7: 1246. 1936; Moldenke, *Phytologia* 2: 219—220. 1947; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 132 & 206. 1949; Moldenke, *Phytologia* 3: 343. 1950; E. J. Salisb., *Ind. Kew. Suppl.* 11: 88. 1953; Moldenke, Ré-

sumé 170 & 482. 1959; E. H. Walker, *Bibl. East. Asiat. Bot. Suppl.* 1: 235. 1960; Moldenke, *Résumé Suppl.* 17: 5. 1968.

Both binomials applied to this taxon were based on the same type collection, J. F. C. Rock 10843, from Yunnan, China. That of Handel-Mazzetti, being the earlier, is the one which must be adopted.

Additional citations: CHINA: Yunnan: Maire 3925 (Ca—389088).

ERIOCAULON ROLLANDII Rousseau

Bibliography: Rousseau, *Bull. Jard. Bot. Brux.* 27: 372. 1957; A. & D. Löve, *Bot. Notiser Lund III*: 380 & 385. 1958; Moldenke, *Résumé* 424 & 483. 1959; Moldenke, *Résumé Suppl.* 1: [1]. 1959; G. Taylor, *Ind. Kew. Suppl.* 13: 52. 1966; Moldenke, *Phytologia* 18: 376 & 377. 1969.

The type of this species was collected in the Lake Mistassini region of Canada. No cytological information is as yet available concerning it.

ERIOCAULON ROSEUM Fyson

Bibliography: Fyson, *Journ. Indian Bot.* 1: 50 (1919) and 2: 204 & 205. 1921; A. W. Hill, *Ind. Kew. Suppl.* 6: 79 (1926) and 7: 89. 1929; Moldenke, *Known Geogr. Distrib. Erioc.* 24 & 39. 1942; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 129 & 206. 1949; Moldenke, *Résumé* 165 & 483. 1959.

Illustrations: Fyson, *Journ. Indian Bot.* 2: 205. 1921.

Fyson's original description of this species (1921) is as follows: "E. roseum Fyson, sp. nov. (Kurz. 232 in *Herb. Calc.*)

Caulis perbrevis. Folia caespitosa 2—8 cm. longa, basi ad apicem contracta, plana, tenuia, in sicco rubescentia. Pedunculi plures, valde tenuia, glabra, 10—25 cm. alta. Capitula 4—6 mm., lata, sed bractae involucentes demum 2—3 mm. longiores, tenues et reflexae. Bractae flores superantes acutae, nigrescentes. Receptaculum altum, valde villosum. Flores trimeri, flos ♂; sepala in spathan antice fissam connata; petala parva, subequalia; antherae nigrae. Flos ♀: — sepala aequalia, nigrescentia; petala angusta-oblongata. Burma: Pegu, Kurz. This may be considered a very pronounced stage in the lengthening of the involucre bracts, begun in this series by var. Martiana of E. quinquangulare and it might perhaps be more properly considered a variety of that species. Its close relationship is shown in the very similar flowers, and the leaves being red or drying red. Of the young heads the involucre bracts are not much longer than the others, they lengthen with age."

ERIOCAULON ROSULATUM Körn.

Synonymy: Paepalanthus rosulatus Mart., *Fl. Bras.* 3 (1): 487, in syn. 1863.

Bibliography: C. Müll in Walp., *Ann.* 5: 930 (1860) and 6: 1171. 1861; Körn. in Mart., *Fl. Bras.* 3 (1): 486—488 & 500, pl. 41, fig. 3. 1863; Ruhl. in Engl., *Pflanzenreich* 13 (4—30): 42, 53, & 287. 1903; Moldenke, *Known Geogr. Distrib. Erioc.* 8, 39, &

53. 1952; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 77. & 206. 1949; Moldenke, *Résumé* 89, 328, & 483. 1959; Moldenke, *Résumé Suppl.* 12: 10. 1965.

Illustrations: Körn. in *Mart., Fl. Bras.* 3 (1): pl. 41, fig. 3. 1863.

The type of this species was collected by Carl Friedrich Philipp von Martius "in sedis arenoso-lutosis prope S. Francisci prope Salgado et in adscensu planities altae Alto de Paranã", Minas Gerais, Brazil, in August, 1818, and is deposited in the herbarium of the Botanische Staatssammlung at Munich. The same specimen is also the type of Martius' binomial.

Citations: BRAZIL: Minas Gerais: Martius s.n. [Macbride photos 18691] (Mu--294--type, N--photo of type, W--photo of type).

MOUNTED CLIPPINGS & ILLUSTRATIONS: *Mart., Fl. Bras.* 3 (1): pl. 41, fig. 3 (B, B); drawings & notes by Körnicke (B).

ERIOCAULON ROUXIANUM Steud.

Synonymy: Eriocaulon rousciamm Steud. ex Moldenke, *Known Geogr. Distrib. Erioc.* 39, in syn. 1946.

Bibliography: Steud., *Syn. Pl. Glum.* 2: (Cyp.) 270. 1855; C. Müll. in *Walp., Ann.* 5: 926 & 936 (1860) and 6: 1171. 1861; Dalz. & Gibs., *Bomb. Fl.* 316. 1861; Ruhl. in *Engl., Pflanzenreich* 13 (4-30): 116 & 287. 1903; Fyson, *Journ. Indian Bot.* 3: 18. 1922; C. E. C. Fischer, *Kew Bull. Misc. Inf.* 1931: 261. 1931; Moldenke, *Known Geogr. Distrib. Erioc.* 23 & 39. 1946; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 127 & 206. 1949; Moldenke, *Résumé* 162, 292, & 483. 1959; Moldenke, *Phytologia* 17: 494. 1968.

ERIOCAULON RUBESCENS Moldenke

Bibliography: Moldenke, *Bol. Soc. Venez. Cienc. Nat.* 23: 99--100. 1962; Moldenke, *Résumé Suppl.* 3: 12. 1962; Sandoval, *Biol. Abstr.* 46: 2128. 1965.

Citations: VENEZUELA: Guaricó: Tamayo & Aristeguieta 4274 (Ve--type).

ERIOCAULON RUHLANDII Schinz

Bibliography: Schinz, *Bull. Herb. Boiss., sér. 2*, 6: 710. 1906; Prain, *Ind. Kew. Suppl.* 4, pr. 1, 82 (1913) and pr. 2, 82. 1938; H. Hess, *Bericht. Schweiz. Bot. Gesell.* 65: 265. 1955; Moldenke, *Résumé* 483 & 494. 1959; Moldenke, *Résumé Suppl.* 1: 10 & 25. 1959; R. H. Compton, *Journ. S. Afr. Bot. Suppl.* 6: 33. 1966; Moldenke, *Résumé Suppl.* 16: 8. 1968.

Hess (1955) gives a detailed description of the flowers of this species: "♀ Blüten: Sepalen 2; diese sind 1--1,3 mm lang, bootförmig oder konkav, vom Kiel bis an den Rand 0,2--0,3 mm breit, spitz, einwärts gebogen, in der oberen Hälfte schwarzgrau, unten weisz, stets kahl. Petalen 3; 0,9--1,2 mm lang, 0,3 mm breit, weisz, innerseits und am Rande mit 0,3--0,5 mm langen Haaren besetzt, auszerseits kahl, an der Spitze mit auffälliger, schwarzer Drüse. Die Frucht ist dreusamig; die rei-

fen Samen sind braun, fast kugelig, der Durchmesser beträgt ca. 0,3 mm. Der Griffel ist um 0,3 mm lang; die drei Narben sind etwa 1 mm lang. ♂ Blüten: Sepalen 2; sie sind 0,9 mm lang, von gleicher Form und Farbe wie die ♀ Blüten. Alle drei Petalen sind stark reduziert, höchstens 0,1 mm lang, tragen an der Spitze aber eine grössere schwarze Drüse als bei E. ciliipetalum. Die Petalen sind kahl. Die 6 Antheren (nicht vier, wie Schinz [1906] in der Diagnose schreibt) sind schwarz. Aus dem Vergleich der beiden Arten ergeben sich folgende Unterschiede: Eriocaulon Ruhlandii hat gedrehte und höhere Halme, grau-schwarz Blütenköpfe, kleinere Hüllbrakteen und kleinere Blüten als E. ciliipetalum."

The type of the species was collected by Friedrich Richard Rudolf Schlechter (no. 2955) at Claremont, at an altitude of 20 meters, Natal, South Africa, on July 18, 1893, flowering and fruiting in July. To Hess the species was known only from the type collection, but Compton (1966) has since recorded it from Swaziland.

Citations: SOUTH AFRICA: Natal: F. R. R. Schlechter 2955 (B-isotype, Z--isotype).

ERIOCAULON SACHALINENSE Miyabe & Nakai

Bibliography: Miyabe & Nakai, Bot. Mag. Tokyo 42: 479. 1928; Mak. & Nemoto, Fl. Jap., ed. 2, 1514. 1931; Miyabe & Kudō, Fl. Hokk. & Saghal. 3: 288. 1932; A. W. Hill, Ind. Kew. Suppl. 8: 87. 1933; Nemoto, Suppl. Fl. Jap. 1039. 1936; Sugawara, Pl. Saghal. 117. 1937; Honda, Nom. Pl. Jap. 462. 1939; Sugawara, Illustr. Fl. Saghal. 2: 517, pl. 241. 1939; Satake, Journ. Jap. Bot. 15: 629 & 632. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6, 13, 61—63, 68, 81, & 87, fig. 1A & 28. 1940; Satake, Bull. Tokyo Sci. Mus. 3: [Rev. Jap. Erioc.] 51—53, 56, & 57, pl. 8, fig. 15. 1940; Moldenke, Known Geogr. Distrib. Erioc. 24 & 39. 1946; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 130 & 206. 1949; Moldenke, Résumé 167 & 483. 1959; Moldenke, Phytologia 18: 255 & 364. 1969.

Illustrations: Sugawara, Illustr. Fl. Saghal. 2: pl. 241. 1939; Satake in Nakai & Honda, Nov. Fl. Jap. 6: 6 & 62, fig. 1A & 28. 1940; Satake, Bull. Tokyo Sci. Mus. 4: [Rev. Jap. Erioc.] pl. 8, fig. 15. 1940.

The type of this species was collected by S. Sugawara in wet places at Hukakusa, on Sakhalin Island, in August, 1927, and is deposited in the herbarium of Tokyo University.

Satake (1940) cites Sugawara s.n. [Otaï, Oct. 1927] in the Kew herbarium and notes "As Prof. Nakai has already found, this plant is very interesting and a good species in having numerous flowers, its appearance being nearest to Eriocaulon atrum Nakai." He also comments that E. kusiroense Miyabe & Kudō lies between E. atrum and E. sachalinense in its taxonomic characters. The only vernacular name recorded for E. sachalinense is "karahuto-hosikusa".

ERIOCAULON SANTAPAU Moldenke

Bibliography: Moldenke, *Phytologia* 3: 166—167 (1949) and 3: 343. 1950; E. J. Salisb., *Ind. Kew. Suppl.* 11: 88. 1953; Razi, *Rec. Bot. Surv. India* 18: 20. 1959; Moldenke, *Résumé* 162 & 483. 1959.

ERIOCAULON SATAKEANUM Tatew. & Itô

Bibliography: Tatew. & Itô, *Journ. Jap. Bot.* 40: 156—157. 1965; Van Steenis & Jacobs, *Fl. Males. Bull.* 20: 1359. 1965.

The type of this species was collected by Misao Tatewaki and Koji Itô in the Kokemuma moor, about 1 km. northeast of Kijima, Inaniwa-kawazure-machi, Ogachi-gun, in Akita Prefecture, on northern Honshu, Japan, in August, 1964.

ERIOCAULON SCARIOSUM J. Sm.

Synonymy: *Eriocaulon smithii* R. Br., *Prodr. Fl. Nov. Holl.* 254. 1810. *Busseuillia novae-hollandiae* Lesson in Bougainville, *Journ. Navig. Autour Globe* 2: 348—351, pl. 46. 1837. *Randalia scariosa* Beauv. & Desv. apud Kunth, *Enum. Pl.* 3: 571, in syn. 1841. *Eriocaulon lhotskyi* Steud., *Syn. Pl. Glum.* 2: (Cyp.) 270 & 334. 1855. *Eriocaulon lhotskyi* Steud. apud Körn., *Linnaea* 27: 653, in syn. 1856. *Eriocaulon smithii* var. σ Körn., *Linnaea* 27: 652—653. 1856. *Eriocaulon smithii* var. φ Körn., *Linnaea* 27: 652—653. 1856. *Eriocaulon smithii* var. γ Körn., *Linnaea* 27: 652—653. 1856. *Randalia scariosa* Beauv. apud Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 2: 681, in syn. 1895. *Eriocaulon schmithii* R. Br. apud Däniker, *Vierteljahrsschr. Naturf. Ges. Zürich* 77, Beibl. 19: 91, sphalm. 1932. *Eriocaulon leucocephala* Roxb. ex Moldenke, *Résumé Suppl.* 1: 17, in syn. 1959. *Eriocaulon sordidum* Ruhl. ex Moldenke, *Résumé Suppl.* 2: 9, in syn. 1960.

Bibliography: J. E. Sm. in Rees, *Cycl.* 13: *Eriocaulon*. 1809; R. Br., *Prodr. Fl. Nov. Holl.* 254. 1810; Roem. & Schult. in L., *Syst. Veg.*, ed. 15 nov., 2: 869. 1817; Spreng. in L., *Syst. Veg.*, ed. 16, 3: 775. 1826; Desv., *Ann. Sci. Nat. Paris*, sér. 1, 13: 47. 1828; Lesson in Bougainville, *Journ. Navig. Autour Globe* 2: 348—351, pl. 46. 1837; Kunth, *Enum. Pl.* 3: 569—571. 1841; Steud., *Syn. Pl. Glum.* 2: (Cyp.) 270 & 334. 1855; Körn., *Linnaea* 27: 652—655. 1856; F. Muell., *Fragm.* 1: 94 & 95. 1859; C. Müll. in Walp., *Ann.* 5: 925—927 & 941 (1860) and 6: 1171. 1861; Benth. & F. Muell., *Fl. Austral.* 7: 191—193, 197, & 792. 1878; F. Muell., *Syst. Census Austral. Pl.* 123. 1882; F. M. Bailey, *Syn. Queensl. Fl.* 578. 1883; Moore & Betche, *Handb. Fl. N. S. Wales* 440. 1893; Jacks. in Hook. f. & Jacks., *Ind. Kew.*, pr. 1, 1: 878 (1893) and 2: 681. 1895; Britten, *Journ. Bot.* 38: 482 & 483. 1900; F. M. Bailey, *Queensl. Fl.* 6: 1715. 1902; Ruhl. in Engl., *Pflanzenreich* 13 (4-30): 60, 66, 286, & 287. 1903; F. M. Bailey, *Compreh. Cat. Queensl. Pl.* 584. 1913; Domin, *Bibl. Bot.* 20: 507. 1915; Maiden & Betche, *Census N. S. Wales Pl.* 38. 1916; Däniker, *Vierteljahrsschr. Naturf. Gesell. Zürich* 77, Beibl. 19: 91. 1932; Moldenke, *Known Geogr. Distrib. Erioc.* 28, 36, 39, & 40. 1946; Jacks. in Hook. f. &

Jacks., Ind. Kew., pr. 2, 1: 878 (1946) and 2: 681. 1946; Guill-aum., Fl. Analyt. & Synopt. Nouv.-Caléd. 50. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 153, 155, & 206. 1949; Van Steenis, Bull. Jard. Bot. Buitenz., sér. 3, 18: 460—461. 1950; Moldenke, Phytologia 3: 343—344. 1950; E. J. Salisb., Ind. Kew. Suppl. 11: 38. 1953; Moldenke, Résumé 209, 211, 240, 289, & 483. 1959; Moldenke, Résumé Suppl. 1: 17 & 18 (1959) and 2: 9. 1960; Jacks. in Hook. f. & Jacks., Ind. Kew., pr. 3, 1: 878 (1960) and 2: 681. 1960; Moldenke, Résumé Suppl. 3: 26 & 32. 1962; J. H. Willis, Handb. Pl. Vict. 281. 1962; Beadle, Evans, & Carolin, Handb. Vasc. Pl. Syd. Dist. 483. 1963; J. W. Vickery, Contrib. N. S. Wales Nat. Herb. 3: 450. 1965; B. G. Briggs, Contrib. N. S. Wales Nat. Herb. 4: 26. 1966; Airy Shaw in J. C. Willis, Dict. Flow. Pl., ed. 7, 168. 1966; O. D. Evans, Contrib. N. S. Wales Nat. Herb. Fl. Ser. 27/28: 10—12. 1966; Ornduff, Reg. Veg. 55: 13 & 113. 1968; Moldenke, Phytologia 18: 80, 326, 327, & 367. 1969.

Illustrations: Lesson in Bougainville, Journ. Navig. Autour Globe 2: pl. 46 [in color]. 1837.

The original description of E. scariosum by Sir J. E. Smith (1809) is "Stalks aggregate, five-angled. Leaves and sheaths smooth, of equal length. Head globose. Calyx-scales obovate, acute. -- Communicated from New South Wales in 1792, by John White, M.D. -- Stalks five or six inches high. Head of a silvery white, scarcely so large as a pea, being about twice as big as the former." By the expression "the former" he doubtless means E. pygmaeum Soland., previously described by him.

Eriocaulon smithii is based on Sieber, Fl. Nov. Holl. 582, and was originally described as follows: "Scapo angulato; striato (5-8-unciali), foliis glabris planis multoties longiore; capitulo florido globoso; squamis involucrantibus paleisque imberbibus; perianthis obsolete barbatis". Kunth (1841) has greatly amplified this description from the type collection with the addition also of fruit characters taken from another collection (collected by d'Urville).

The E. scariosum of Brown, now known as E. brunonis Britten, is described by him as "Scapo multistriato (spithamaeo), foliis planiusculis longiore; capitulo florido subgloboso, scarioso, pallido; squamis exterioribus vacuis, obtusis; paleis mucronatis, imberbibus; perianthii feminei exterioris foliolis lateralibus falcatis carina alata."

It is possible that the J. E. Smith collections cited below may represent the original type material collected by Dr. White. The Herb. Roth s.n. specimen in the Berlin herbarium has a label reading "Heyne 1874 in India orientali legit" and another reading "Eriocaulon leucocephala Roxb." attached to the sheet, but these labels probably do not belong there -- E. leucocephalum Steud. is a synonym of E. quinquangulare L.

Körnigke (1856) divides the species into three unnamed varieties, as follows: "var. α -- pedunculis usque 8-pollicaribus; foliis [cont.]